A Review on DevOps trending Adaptation and impact of its implications

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Abstract: The enterprise customers want transition to happen as quickly as possible—new technologies, programmes, and revenues. Simultaneously they need a system that is secure and free of outages and interruptions at the same time. As a result, businesses are faced with the dilemma of either delivering improvements rapidly and coping with an unpredictable production climate, or sustaining a steady yet outdated environment. So DevOps is a culture to be indulged for meeting the changing requirement of customers, enterprises by initiating Developers and deployment administration to work together creating concept of one focus for business users, developers, test engineers, security engineers, system administration designing highly automated workflow with a shared focus: rapid delivery of high-quality software that meets all user requirements while maintaining the integrity and stability of the entire system.

IndexTerms – Information Technology, DevOps, Technology, Software Development, Operation, Automation.

I. INTRODUCTION

Today’s customer’s prospective of a product expectation depends on varying factors i.e high performance yielding, automation, software deployment frequency, reliability, real time automatic testing, continuous integration process and adaptability. The shift paradigm to DevOps became more desperate due to outbreak of the pandemic COVID19. People could not go to workplace and due to dependency on data because of existing pipeline work culture delivery, testing, development were stopped. So, more and more businesses are now turning towards the adoption of a DevOps culture with a shared focus for designing highly process automation workflow with fast delivery of high-quality applications that addresses all user needs while preserving the system’s sustainability.

Through DevOps culture system the organization can facilitate:

- Virtual environment curbing dependencies of resources.
- Virtual platform for product development and deployment frequently with speed.
- Transition to active responsive bidirectional networking.
- Integrate feedback and increase responsiveness into the work, measuring everything that is moved into production facilitating automation.
- Better resource management - Share the data with everyone involved to foster a more effective culture of working well together across different skills and specialization.
- Waste reduction through maintenance and auto upgradation.
- Smart and stable business with pace for innovations: Opting DevOps culture enhances the development speed maintained with frequent deployment minimizing error. Continuous integration servers automate the testing of code, reducing the amount of time spent on manual labor. End product has stable operating environment hence efficiency increases and leads to further smart innovations.
STATICS OF DEVOPS USAGE IN TODAY’S SCENERIO: DevOps is becoming an inevitable culture in several businesses.

II. IMPLEMENTATION OF DEVOPS IN BUSINESS

The design of computing has changed over the last decade as a result of the proliferation of Web, tablet, and IoT applications. There are 1.5 million applications in the Apple App Store (which launched in June 2008) and 1.8 million in the Google Appstore. (opened in December 2009). With the shift to app-based value delivery to customers, software has become increasingly componentized and architected with service-oriented models in mind. Obtaining the technical benefits of re-architecting applications to allow for faster, more feature-rich delivery is, unfortunately, very expensive and time-consuming.

III. OBSTACLES IN IMPLEMENTING DEVOPS CULTURE

- Transformations and management of the cultural changes inside an organization. Strong leadership using five dimensions (vision, intellectual stimulation, inspirational communication, supportive leadership, and personal recognition) to inspire and guide implementation.
- As solutions for each organization is custom. Each one should adopt and adapt its own approach to realize DevOps success.
- DevOps implementation should take a comprehensive approach that includes automation (including tools and architecture), operation, and culture. Information in the form of a T-shaped knowledge, with the top portion of the “T” representing basic understanding and the stem of the T representing thorough knowledge in one field of interest.
This enables people to comprehend how their jobs can impact and communicate with various aspects of technology for the transition to DevOps.

IV. CASE STUDIES

The practice of DevOps in enterprises has sustain effectiveness and continuously improving. Some case studies to show the real adaptation of DevOps culture and their growth as follows:
Key benefits of Sprint's move to a simplified cloud-native architecture

Delivers functionality in weeks instead of months
Enables digital, omnichannel experiences and continuous new fast-to-market offerings

- Expected 50% time-to-market reduction for new services and features
- Up to 20% savings in cost of ownership
- Expected 30% reduction in order fall-out rates
- Business users can define offers themselves, reducing time and cost to market
- Anticipated 30% more efficient tre-e-sales and handling of customers' changes to services

Amdocs designed its cloud-native solutions on top of TM Forum’s Open APIs, part of the Open Digital Framework

Taiwan Mobile transforms its OSS with an AI ecosystem

- Operations efficiency improved by 40%
- Customer satisfaction up 11%
- Lowest complaint rate among all Taiwan operators of 0.22%
  (compared to a market average of 0.34%)
- Customer churn down 30%
  (from 2.3% to 2.1%)
- Troubleshooting and problem resolution improved by 83%
- Average Revenue per User of $19.13
  (compared to the market average of $15.53) in a challenging market

TM Forum 2020 (Source: Taiwan Mobile & Amdocs)
IDEAS+: Enabling Telekom Malaysia’s agents to work smarter and faster

Initial IDEAS+ rollout in March 2019 covered 41 service desk agents. By August, it was expanded to 522 agents along with 82 TMPoint retail outlets.

Key Results

- **Up to 3x faster average handling time**
- **Troubleshooting accuracy increased from less than 60% to 98%**
- **Quarterly savings of over RM780,000 (US$190,000)**

Machine learning played a key role by making the troubleshooting process less reliant on each agent’s experience, resulting in a faster process and improved accuracy, thereby delivering improved customer satisfaction and bottom line.

TM Forum best practices and standards, including the AI Maturity Model, helped Telekom Malaysia Research & Development develop a future-proof platform to easily integrate any external system and support new requirements.
V. ORGANISATIONAL DEVPASS MATUREITY MODEL


Fig4: DevOps Challenges and Solution
Sort out the pitfalls in the delivery process.
- Analyse the actual capacity of maturity model.
- To assess priorities, build interactive map of capacity gaps and progress zones.
- Create a framework with goals and deadlines for completion.

What the DevOps Maturity Assessment model will do for you?
- Unlocks the ability to comprehend DevOps sophistication from both a customer and a service provider’s viewpoint in relation to the DevOps process.
- Builds up straightforward roadmap projects to advance DevOps technologies and environments to the next level of maturity and enable the adoption of desirable utilisation.
- Automated security checks, bug fixes, and build alerts are all integrated before things move to production and deployment.

What the DevOps Maturity Assessment model will do for you?

DevOps Maturity Model

<table>
<thead>
<tr>
<th>Basic</th>
<th>Managed</th>
<th>Defined</th>
<th>Advanced</th>
<th>Optimised</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build/Develop</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>action, commit</td>
<td></td>
<td>2. Artifacts are managed</td>
<td>2. MRR &amp; Version Control</td>
<td>2. MRR &amp; Code Scan</td>
</tr>
</tbody>
</table>
| | | 3. Automated | 3. Alert for V

Fig 5: DevOps Maturity Model designed by Tusar Ranjan Panigrahi

Based on the facts I have designed above DevOps maturity model. Where the driving factor should be the Mindset to adopt DevOps culture and gain maturity against the gaps in handshake process between Development and Operation.

VI. FUTURE TREND

DevOps is a culture, a visionary mindset to be explored continuously creating a revolutionary effective impact in different sectors of business.

**Teaming data scientist and DevOps:**
A new transition with the concept of DevOps + Data Science opts to DataOps. A DevOps approach powered by Artificial Intelligence (AI) and Machine Learning (ML) enables organisations to approximate and scrutinise data of any size and scale.

**Devsecops:**
COVID-19 has developed a global remote work environment, exposing security vulnerabilities. With the rise of security and cyberattack attacks, it’s more important than ever to incorporate security into all aspects of business operations.

**Virtual Platform:**
Virtual Platform enables DevOps & Microservices architecture saving cost, time, and resources.

**DevOps and agile:**
AgileOps is an IT operating model designed for digital companies that comes with agile concepts to make agile working practises.
- **Container Technology:**
  Multiple microservices are usually combined in containers to form a full software feature. The container simplifies deployment in a variety of settings.

- **Edge Services:**
  It gives the Infrastructure and Operations teams a better understanding of the tools and facilities in use, as well as how they can be used in the future to achieve the best results.

- **Automation:**
  This will make it easier to spot more complex protection, functionality, and performance problems.

- **Industrial DevOps:**
  Scaling Industrial Internet of Things (IIoT) solutions necessitates a DevOps team capable of managing increased software and hardware complexity in terms of functionality, capacity, and sustainability.

- **Global DevOps Industry:**
  ✓ Financial Sector
  ✓ Inventory management
  ✓ DevOps CD/CI in Healthcare
  ✓ Salesforce DevOps
  ✓ Manufacturing Industry
  ✓ Hospitality

VII. PROFESSIONAL FEEDBACKS

- "More developers will move to application security's front lines."
  — Derek Weeks, vice president and DevOps advocate at Sonatype, and co-founder of the All Day DevOps conference

  Better security and productivity outcomes. By 2024, 40% of development teams will make it into the high-performer category, up from 25% today, demonstrating both high-velocity releases and strong security outcomes.

- "Application security will no longer be an afterthought."
  — Jonathan Knudsen, senior security strategist, Synopsys

  Application teams will gradually follow a DevSecOps approach, in which they completely exploit automation to increase velocity and foster a culture of continuous improvement that helps each team to tune and optimise its processes.

- "CISOs will embrace DevSecOps methodologies."
  — Liz Rice, vice president, open-source engineering, Aqua Security

  Cloud-native security will rise higher on the agenda for CISOs as their organizations embrace Kubernetes, serverless, and other cloud-native technologies.
“Organizations will strive to achieve the platform-as-a-product model for internal platforms, but adoption will be difficult.”
—Matthew Skelton, founder of Conflux & co-author of book Team Topologies

Organizations seeking to limit the cognitive load on software product teams have successfully used a platform-as-a-product model for defining, refining, and running their internal platforms.

“Microservice configuration management will become critical for tracking and deploying logical application versions and microservices across clusters.”
—Tracy Ragan, CEO and co-founder, DepioxHub

Tracking the configurations and versions of services to application relationships will eliminate the risk and complexity of a microservice implementation.

“DevOps will integrate with AIOps to provide seamless operational feedback, and automated bug fixes will remove most human involvement.”
—David Linthicum, chief cloud strategy officer at Deloitte Consulting

The objective will be to provide automated improvement of application operations, without having to have humans figure out what’s wrong and how to fix it.

“DevOps will follow the path of ‘BADgile,’ becoming DevOps for most teams.”
—Hans Eckmann, principal research director, applications—agile development and management, Info-Tech Research Group

Rigorous automated and manual testing to verify quality standards and security specifications, as well as the separation of duties across workflows, by successful DevOps teams.

“Organizations will finally realize that deploying to production on every code commit isn’t always appropriate.”
—Paul Grizzaffi, principal automation architect at Magenic

Most organisations will realise delivery processes that are consistent with their tolerance for change and failure.
“In an all-digital world, developers will have more important seat at the table.”

—Brendan O’Leary, senior developer evangelist, GitLab

In 2021, software will be seen as critical to business success, and developers will become embedded in business teams, rather than technology teams.

“Developers will have more say in the technology direction and data strategy of their companies.”

—Danny Allan, chief technology officer, Veeam

Increase in the mobility of workloads, correlating with an increase in cloud data management techniques.

“Corporate culture will transform as business leaders shift their focus to systems thinking to drive strategic investments.”

—Carmen DeArdo, senior value stream management strategist, Toskto Technologies

This would lead to a greater emphasis on using systems thinking to determine where and what types of investments will result in desired business results, and then scaling these principles across the enterprise.

“Hybrid product teams will become a pillar of customer value delivery.”

—Jawny Grohl, CEO of the DevOps Institute and author of the 2020 Upskilling Report

Customer value delivered, rather than features or products made, will be the yardstick by which product and engineering teams will be assessed.

“Business leaders will increasingly value DevOps, showing that the work of the DevOps enterprise community matters to the people who matter.”

—Gene Kim, author and founder of IT Revolution

Business leaders will place a greater emphasis on DevOps, demonstrating that the DevOps enterprise community’s efforts are valued by those who matter.
“Analytics techniques will be adopted at every step in the software development lifecycle to make smarter decisions.”
—Mark Conway, director, Office of the CTO, Micro Focus

This will be enabled through analytical systems that will ingest big data across the value stream, including human and machine data, using a variety of analytics techniques such as machine learning, deep learning, NLP, etc.

“Autonomous DevOps automation will become the new normal.”
—Eran Kinsbruner, chief evangelist for Perfecto, Perforce Software

Enable the identification of more complex security, functionality, and performance issues.

“Predictive DevOps will be the next transformation that will deliver business value.”
—Lars Rosson, chief technology officer, Micro Focus

Business people will become part of the team that delivers digital instead of being a consumer of digital.

“DevOps journeys will accelerate as teams adopt value stream management practices and platforms cross-organization.”
—Helen Reed, chief ambassador, DevOps Institute

By inspecting their value stream management platform’s data and insights, teams will be able to adapt, choose whether to pivot or persevere based on value stream performance, and receive real-time customer feedback.

“DevOps will expand from product delivery to value delivery.”
—Yanni Savvas, senior director and chief technologist, Micro Focus

DevOps will expand beyond product delivery to business value delivery and value stream delivery, enabling a broader digital transformation.

“Cybersecurity will move out of the dark ages as intelligent cybersecurity emerges.”
—Lisa Azizova, founder and CEO of Contaas

In this new age of cybersecurity, intelligent machine-generated code will be used to create protection, enforcement, and infrastructure in minutes.
VIII. CONCLUSION
Transformation of working culture, flexibility and an open mindset is required for building a nearly flawless smart business in all sectors software, manufacturing, medical, industries and controlling the work offline and online so the economy is not jeopardised during pandemic situations is possible.
Obtaining a clarity of product and accordingly adapting suitable maturity model to have a insight and proper management of product meeting the criteria of client.
Devops is a process to be followed with a believe, discipline and an optimistic team mindset leading to efficiency and progressiveness.

IX. REFERENCES